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EVALUATION OF URETERO-ILEAL ANASTOMOSIS IN ILEAL CONDUIT

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Ileal conduit anastomosis which was designed by Seiffert (1935)[5] and applied clinically by Bricker (1950)[1] is now extensively conducted in the world as one of the most preferable operation for a diversion of urine flow. However, there has been no established method as to which technique is the most suitable for a ureteroenterostomy.

Uretero-ileal anastomosis was conducted in 28 cases without using the reflux-preventing technique. Uretero-ileal anastomosis was evaluated in detail, viewed from the obstruction of urine flow, especially stenosis, ureteroenteric reflux phenomenon, kidney dysfunction and urinary tract infections. The obtained result was that the application for reflux-preventing technique is not required in conducting a ureteroenterostomy.

METERIALS AND METHODS

Since 1965, uretero-ileal anastomosis was conducted in 28 patients (24 cases of bladder cancer, 2 cases of bladder tuberculosis, 1 case of radiation cystitis and 1 case of interstitial cystitis) without using the reflux-preventing technique.

Ureteroenterostomy was conducted in 26 ureters by using the method of Nesbit[4] and in 19 ureters by using the method of Cordonnier[2].

IVP was conducted before and after the operation to investigate ureteral obstruction at the region of uretero-ileal anastomosis. The degree of hydronephrosis was evaluated based on the classification of Hujino (N, A, B, C, D and E). Rüsch No. 20 balloon catheter was inserted through stoma, and then the urine sample was taken via balloon catheter following inflating up by 5 to 10 ml. The urine taken was supplied for a microscopic examination and culture. PSP excretion test (15 minutes and 120 minutes) was conducted and the results were compared with those of the preoperative. The contrast medium was infused into the ileal conduit via balloon catheter by dripping. Ileostogram was taken by TV fluoroscopy at the pressure of 30 cm of water column to investigate whether the reflux into the upper urinary tract existed or not. All the results of postoperative investigation were those obtained during the period from 60 days to 6.5 years after the operation.

RESULTS

1. Ureteral Obstruction:

Improvement was obtained in all the patients with hydronephrosis before the operation. That is, the improvement was noted in 10 ureters by the Cordonnier's method, in 6 ureters by the Nesbit's method. Improvement from D and C to N or A degree and from B to N or A degree was noted in the Cordonnier's method, while that from C to N degree, from B to N degree and from A to N degree was obtained in the Nesbit's method. The extent of improvement obtained by the latter was superior to that by the former.

In the improvement of N degree, no change was noted in 6 out of 9 cases with a normal pyelogram in the Cordonnier's method and the deterioration to A or B degree was noted in the remaining 3 cases. Whereas, no change was obtained in 15 out of 20 cases with a normal pyelogram and the remaining 5 cases deteriorated to A, B or C degree. Although there was no statistically significant difference between these methods, it seems that the superiority was noted in the Nesbit's method in regard to the incidence of ureteral obstruction (Fig. 1).

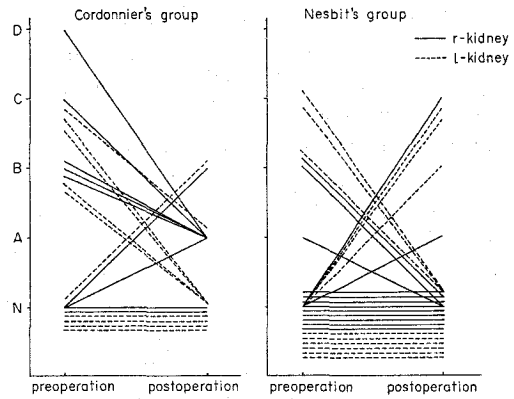

Fig. 1. Grade of hydronephrosis.

2. Ureteral Reflux:

Reflux was noted in 11 out of 15 cases (73.3 %) in the Cordonnier's method, while it was observed in 9 out of 17 cases (52.9 %) in the Nesbit's method. When the incidence was compared between the right and left ureters in each method, in the Cordonnier's method, the reflux was observed in 7 out of 8 cases on the left and 4 out of 7 cases on the right ureter. Whereas, in the Nesbit's method, it was noted in 7 out of 8 cases on the left and 2 out of 9 cases on the right. The above results indicate a less possibility of reflux in the Nesbit's method and on the right ureter (Fig. 2).

3. Renal Function:

PSP excretion test was conducted in 12 cases before and after the anastomosis for ileal conduit to examine the change of renal function. As shown in Fig. 3, the improvement of kidney dysfunction was

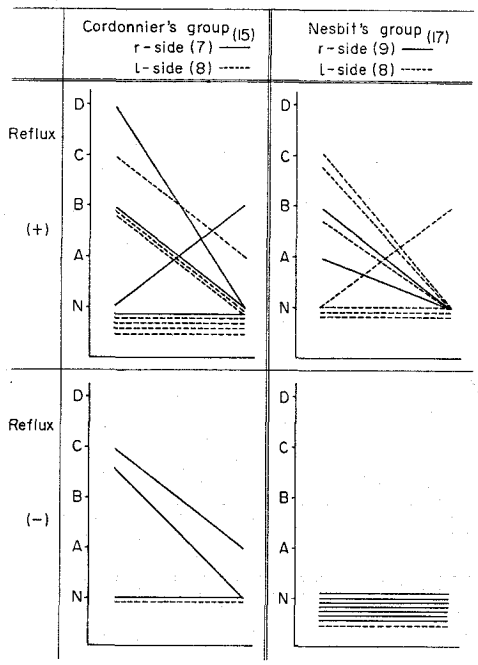

Fig. 2. Ureteral reflux.

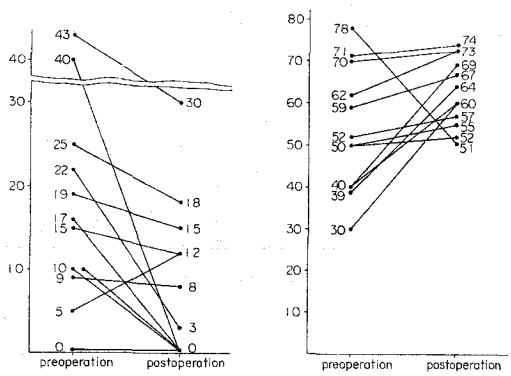

Fig. 3. PSP excretion test.

noted in 1 case and no change was observed in 1 case in the first 15 minutes of PSP excretion test. The decreased PSP excretion was seen in the remaining 9 cases after the operation. Whereas, in 120 minutes excretion of PSP test, the result showing the improvement of kidney dysfunction was observed in 11 cases except 1 case complicated with inflammation in the dead space after total cystectomy.

4. Urinary Tract Infections:

Urine cultures were performed in 22 cases. Organisms were isolated in 7 out of 22 cases (31.8 %) before and after the

operation. No organisms were isolated in 8 out of 22 cases (36.4 %) before and after the operation. The urine culture showed a negative in 3 out of 10 cases (30 %) after the operation, although a positive urine culture was observed in these 3 cases before the operation. After the operation, a positive result was obtained in urine culture in 4 out of 12 cases (33 %) who had a negative before the operation (Fig. 4).

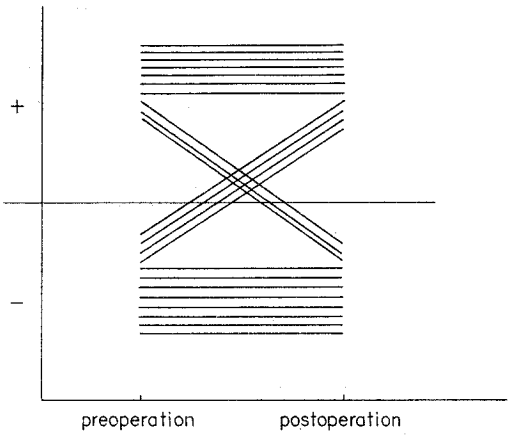

Fig. 4. Urine culture before and after the operation.

DISCUSSION

Since the obstruction of urine flow and ureteroenteric reflux following the uretero-ileal anastomosis may induce the untoward complications such as kidney dysfunction and/or urinary tract infections, there are some problems in the method of uretero-enterostomy. The direct method was conducted by using the method of Nesbit or Cordonnier without reflux-preventing technique.

Although no statistically significant defferences were observed in ureteral obstruction between the Nesbit's and Cordonnier's methods, the superiority was somewhat noted in the former. The completely satisfactory results were not obtained, but the more improved results will be able to be obtained in the benefit of attention and skill of operators.

The high incidence of reflux was noted because the reflux-preventing technique was not performed. There were, however, some difference between the both methods. The incidence of reflux was less in the Nesbit's method. The following reasons are considered: In the case of Nesbit's method, ureter is incised in the length of approximately 5 to 10 mm at the side facing the ileal conduit and therefore the ureter at this side becomes shorten. When the conduit is filled up with contrast medium, it is revolved, and as a result the ureter is compressed, therefore the reflux became harder to occur (Fig. 5). On the other hand, in the case of Cordonnier's method, the length of ureteral wall facing the conduit is the same as that of the opposite site. Therefore, when the conduit is filled up, the compression of the surface of ureter is decreased, resulting in reflux (Fig. 4).

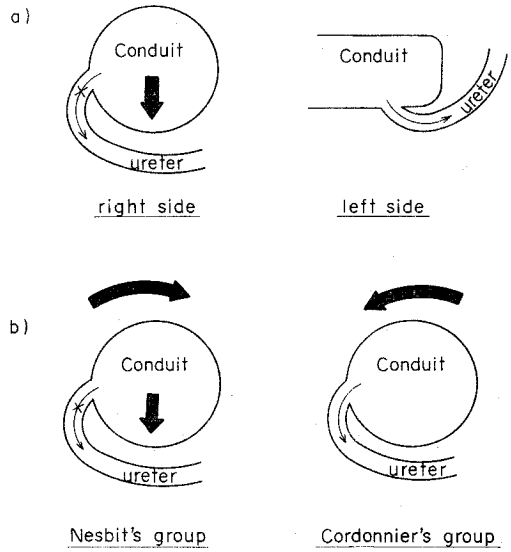

Fig. 5. Ileo-ureteral reflux phenomenon when isolated ileal conduit distended.

Another interesting subject was that the incidence of reflux was lower on the right side than on the left side. The following speculation was made for these reasons. The ileal conduit was used in the length as short as possible, and the excised end of the isolated ileum was placed on the median line as close as possible. Therefore, the left ureter became not to be compressed by the conduit and as a result reflux became easier to occur (Fig. 5). Whereas on the right side, the possibility of semicircular turn from the back side of the ileum is

larger and as a result the compression by the conduit became somewhat stronger than the left side, but it was not so strong as to cause obstruction of passage of urine flow.

We must emphasize that the reflux was noted under the pressure of 30 cm H_2O but never under that of 5 cm H_2O.

As described previously, in the occurrence of ureteral obstruction and reflux, its close relation with kidney dysfunction and urinary tract infections must be considered.

15 minutes excretion of PSP revealed the decreased kidney function in the majority of cases after the operation, while 120 minutes excretion revealed improved kidney function in all the cases except one case with inflammation of the dead space after total cystectomy.

These results indicate that ileal conduit may become the dead space to certain extent as a secondary result. The decreased renal function after the operation should be expected to improve even if a slight stenosis was observed in a few cases and reflux was noted in most of the cases. As to the postoperative urinary tract infections, the similar consideration to the kidney function should be also made. The urinary tract infections improved in 3 out of 10 cases. The aggravation was noted in 4 out of 10 cases, of whom 1 case was attributable to the stenosis of stoma, 1 case had nephrolithiasis. Acute pyelonephritis was observed in these 2 cases. In cases without pyelonephritis, inflammation of the dead space after total cystectomy was noted in 1 case, and in the remaining 1 case there was the possibility of disapperance of urinary bacteria since only short period had elapsed after the operation. As described above, it can be concluded that this operation does not aggravate the degree of urinary tract infections.

SUMMARY

In ileal conduit, the direct uretero-ileal anastomosis was conducted in 28 cases by using the method of Cordonnier or Nesbit. And the reflux-preventing technique was not used in this study.

The results are as follows:

1) Ureteral obstruction was noted in 8 out of 19 ureters in the Cordonnier's method, while it was observed in 5 out of 26 ureters in the Nesbit's method.

2) Ureteral reflux was noted in 11 out of 15 ureters in the Cordinnier's method, while 9 out of 17 ureters in the Nesbit's method. Reflux was observed in 14 out of 16 ureters on the left, whereas 6 out of 16 ureters on the right.

3) PSP values at 15 minutes were lower, but those at 120 minutes improved except in one case.

4) Urinary tract infections improved and did not aggravate except for special cases.

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回腸導管における尿管腸吻合術の再検討

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尿管腸吻合法として，Cordonnier 法または Nesbit 法を用いた ileal conduit 28例を対象に尿管腸吻合法のあり方についての検討をおこない，次のごとき結果が得られた．

1) Ureteral obstructions が Cordonnier 法に19尿管中8尿管に，Nebist 法に26尿管中5尿管に発生した．

2) 逆流が Cordonnier 法15尿管中11尿管に，Nesbit 法17尿管中9尿管に，左，16尿管中14尿管に，右，16尿管中6尿管に発生した．

3) PSP は15分値に低下をみるが，120分値に改善がみられた．

4) 本術式によると考えられる尿路感染の悪化はみられなかった．

5) 上記の成績から，尿管腸吻合に逆流防止法の設定は必ずしも要しないとの見解に達した．